Space Weather Forecast

Issued on Thursday, 10 February 2022 at 12:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of G1/Minor Storm on day 1 (10 Feb), then Chance of a G1 on day 3 (12 Feb) or on day 4 (13 Feb). Chance of a Moderate-class flare.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been low over the last 24 hours, with several Common-class flares. The most energetic of these was a C5.7 at 09/1736 UTC from a mature spot near the southwest limb which has faded somewhat since the flare. Two regions in the northern hemisphere are both large, but relatively magnetically simple, and now have the highest flare risk. There are two new regions in the southwest quadrant, both currently magnetically very simple and weak. No further Earth directed Coronal Mass Ejections have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind showed the arrival of a weak CME at 09/2010 UTC which left the Sun on 06 Feb. The wind speed was just below 400 km/s when the CME arrived and it increased to around 430 km/s, since varying between 390-440 km/s. The Interplanetary Magnetic Field jumped from weak to moderate. The north-south component initially varied weakly but increased to vary moderately. Geomagnetic activity was Quiet (Kp 0-2), with two Unsettled (Kp 3) intervals 10/0000-0600 UTC.

Energetic Particles / Solar Radiation: No solar radiation storms have been observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is forecast to remain low through the next four days, with a chance of an isolated Moderate-class flare, mainly from the two larger regions in the northern hemisphere.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 06 February arrived at 09/2010UTC, though it is a weak feature. Continuing weak CME effects are likely through the next 24 hours. The fast wind from a coronal hole is then expected to give wind speeds around 600 km/s on day 3 (12 Feb) or on day 4 (13 Feb). Geomagnetic activity is expected to start Quiet to Active with a Slight Chance of G1/Minor Storms, with residual effects of this CME possible into day 2 (11 Feb). Mainly Quiet activity thereafter until day 3, when the fast wind will likely give Unsettled to Active conditions with a chance of G1/Minor Storm on Days 3 and 4.

Energetic Particles / Solar Radiation: There is just a slightly raised risk of an S1 radiation storm, if we see a Moderate-class flare from any of the sunspot regions in the western hemisphere.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	40	40
Strong	G3	No	1	1	5	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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